

AMENDED CLAIMS

1. A method of producing molecularly imprinted
microspheres comprising specific binding sites,
characterised by polymerising functional
monomers and crosslinkers in a reaction solvent in the
presence of print molecules as templates in a surfactant-
free precipitation polymerisation process, which print
molecules are capable of forming non-covalent or
reversible covalent interactions with said functional
monomers.
2. A method according to claim 1, wherein the total
volume of polymerisable monomers and crosslinkers is kept
in the range of about 0.01 to 20 % of the volume of the
reaction solvent.
3. A method according to claim 1 or 2, wherein the
reaction solvent is aqueous or non-aqueous.
4. A method according to claim 1 or 1, wherein said
reaction solvent is composed of a single solvent
component or of multiple solvent components.
5. A method according to claim 1, wherein said
functional monomers have the same functionality.
6. A method according to claim 1, wherein said
functional monomers have different functionality.
7. A method according to claim 1 or 2, wherein the
solubility of the print molecules in the reaction solvent
is adjusted by changing the composition of the reaction
solvent.
8. A method according to claim 1, wherein the
polymerisation is induced by heat, UV radiation,
 γ radiation and/or chemically.
9. A method according to claim 1, wherein said
polymerisation process is a free-radical polymerisation
process, an ionic polymerisation process, a coordination
polymerisation process or a step growth polymerisation
process.

10. A method according to claim 1 or 2, wherein a desired size of the microspheres is achieved by controlling the nucleation and particle growth process.
11. A method according to claim 10, wherein the control of the nucleation and particle growth process is achieved by adjusting the composition of the functional monomer/crosslinker/solvent system and/or the reaction conditions during the polymerisation in order to change the solubility of the growing polymer chains.
12. A method according to claim 10, wherein the control of the nucleation and particle growth process is such as to avoid aggregation of the microspheres.
13. A method according to claim 1 or 2, wherein the size of the microspheres as produced is in the range of 0.01-10 μ m.
14. A method according to claim 1 or 2, wherein the reaction conditions are controlled so that the microspheres become monodisperse.
15. Use of the molecularly imprinted microspheres as prepared according to any one of claims 1-14, for screening of chemical libraries, for catalysis, for facilitating synthesis, for analyte determination using ligand binding assays and/or agglutination assays, for therapeutic purposes, or for controlled release.
16. Use of the molecularly imprinted microspheres as prepared according to any one of claims 1-14, as stationary phase or modifier in capillary electrophoresis, capillary electrochromatography or HPLC analysis.
17. Use of the molecularly imprinted microspheres as prepared according to any one of claims 1-14, as recognition component in biomimetic sensors.
18. Use of the molecularly imprinted microspheres as prepared according to any one of claims 1-14, as affinity-labelled probe for targeting cells or other biological material.

19. Use of the molecularly imprinted microspheres as prepared according to any one of claims 1-14, as binding entities for the preparation of composite materials.